4.18 WATER QUALITY AND SEDIMENTS

This section presents baseline conditions in the proposed Project area and discusses potential impacts and mitigation related to construction and operation of the Project. It also evaluates impacts of alternatives to the Project. Comments received during public scoping and review of the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) are also addressed in this section. Representative comments included impacts on water quality from spills; erosion; and discharge of ballast waters, sewage, cleaning and wash down waters, and other wastes. This section does not discuss international ramifications of Project activities on water quality and sediments (such as ballast discharge in foreign ports) because any overseas activities would be within the jurisdiction of other countries.

4.18.1 Environmental Setting

This section describes the marine water, groundwater, and surface water resources in the Project area. It includes the characteristics of the sediment in the Project area because water quality is affected by sediment chemistry.

The Project involves the installation and operation of a floating storage and regasification unit (FSRU) approximately 12.01 nautical miles (NM) (13.83 miles or 22.25 kilometers [km]) offshore of Ventura County, two 24-inch (0.6 meter [m]) diameter pipelines from the FSRU to shore and the metering station at the Reliant Energy Ormond Beach Generating Station, and two onshore pipelines in Oxnard and Santa Clarita. The offshore pipelines would be installed beneath Ormond Beach using horizontal directional boring (HDB). The FSRU would convert natural gas from its liquid to gaseous form and would operate for 40 years. Construction and installation activities have the potential to release contaminants to surface water, and the FSRU would have several discharges to the ocean during its operation, including ballast water, treated sewage, storm and wash down water, cooling water, and fire suppression system testing water. Also, anti-fouling paint on the FSRU's hull could impact the surrounding water.

Offshore

4.18.1.1 Marine Water

Water quality of the ocean waters within the Southern California Bight and the Project area, specifically temperature, salinity, dissolved oxygen, pH, transparency, trace metals, and waterborne bacteria, is presented in Table 4.18-1.

Table 4.18-1 Major Water Quality Parameters of the Ocean Waters in the Project Vicinity

Temperature	• Surface water temperatures at Port Hueneme (Entrix 2004a) exhibit a cyclical pattern, with the lowest mean temperature (55.8° Fahrenheit [°F] [13.2° Celsius (°C)]) occurring during February and March and the highest mean temperature (62.2° F [16.8° C]) occurring during August (Entrix 2004a). Surface water temperature data collected offshore of the Reliant Energy, Inc. (Reliant) Ormond Beach Generating Station are consistent with the Port Hueneme data (Entrix 2004a). • During warmer months, the temperature difference between water at the surface and water at a depth of 200 feet (61 m) may be 15° F (8.3° C) to 20° F (11.1° C); this difference can be as small as 1° F (0.6° C) to 2° F (1.1° C) in winter (Entrix 2004a).
Salinity	• Salinity typically increases as depth increases, with concentrations varying between 33.5 and 33.8 parts per thousand (ppt) in the Southern California Bight (Entrix 2004a).
Dissolved oxygen	• Dissolved oxygen concentrations over the Southern California coastal shelf range from 6.6 to 11 milligrams per liter (mg/L) (90 to 135 percent of saturation) in surface waters and from 2.5 to 10.3 mg/L at the ocean bottom (Santangelo et al. 1994).
pH	• The pH in southern California coastal waters varies around a mean of approximately 8.1 (Entrix 2004a).
Surface light transmittance	• Visual transparency along the coast of Southern California varies from an average of less than 20 feet (6.1 m) to greater than 50 feet (15.2 m), with the lowest values occurring close to the coast and the highest values farther offshore (Entrix 2004a).
Trace metals	• The levels of metals in the waters of the Southern California Bight are within ranges reported for seawater in various areas around the world.
Waterborne bacteria	• In 2001, health warnings were posted at Ormond Beach near J Street for 64 days and at the industrial drain for 63 days. The frequency of exceedances for these beaches was high compared to the 10-day average frequency of closure for other beaches in the county.

Source: Entrix 2004a.

4.18.1.2 Marine Sediment

Sediment in the Project vicinity consists of very fine to medium sand (Welday and Williams 1975). Some gravel, muddy sand, and mud are also present. Deeper escarpment and basin sediments consist mainly of very fine silts and clays. The construction of Port Hueneme effectively trapped much of the sediment supply to Ormond Beach. Approximately 1.9 million cubic yards (1.45 million cubic meters [m^3]) is dredged biannually from Port Hueneme and deposited to intertidal and subtidal habitats at Ormond Beach. Surficial sediment composition and quality in the Project vicinity are influenced by several factors, including tides, currents, wave action, and natural oil and gas seeps. Human influences, including dredging, surface water runoff, industrial and domestic outfalls, oil spills, and discharge from ships, also affect sediment quality.

Results from recent sediment and water sampling events reflect current water quality and sediment conditions near Ormond Beach. In August and September 2003, the Applicant collected sediment samples at the proposed offshore HDB exit points. A 100-foot (30.5 m) by 150-foot (45.7 m) site was divided into four quadrants. Sediment

samples were collected in each of the four quadrants at 0-, 10-, and 15-foot (0, 3.5, and 4.6 m) depths and were analyzed for metals, chlorinated pesticides, polychlorinated biphenyls (PCBs), phenols, volatile organic compounds (VOCs), and polynuclear aromatic hydrocarbons (PAHs). Analytical results for these samples are summarized in Table 4.18-2.

The analytical results indicate that the concentration of detected analytes[1] in the sediment of the proposed offshore HDB exit location are below the lower effects range and are therefore not expected to impact benthic species.

In April and September 2004, Reliant Energy conducted sediment sampling and analysis in accordance with its National Pollutant Discharge Elimination System (NPDES) Permit (No. CA0001198). Sediment samples were collected from six locations near the Reliant Energy Ormond Beach Generating Station's outfall, located approximately 2,000 feet (610 m) offshore, and were analyzed for chromium, copper, nickel, and lead. Analytical results for these samples are summarized in Table 4.18-3. In addition, the Applicant conducted sediment sampling at the proposed offshore HDB exit points.

The analytical results indicate that the concentration of metals in the sediment in the vicinity of the Reliant Energy Ormond Beach Generating Station are below the lower effects range and therefore are not expected to impact benthic species.

In addition, water samples were collected at each of the six sampling stations identified above, as well as three stations well away from the outfall including one station approximately 9,000 feet (2,740 m) northwest of the outfall; one station approximately 1,500 feet (457 m) southwest of the outfall; and one station approximately 9,000 feet (2,740 m) southeast of the outfall. Temperature, dissolved oxygen, pH, and salinity were continuously measured throughout the water column during both the summer and winter sampling events. The data were measured in situ at approximately 3-foot (1 m) intervals and are summarized in Table 4.18-4.

The California State Water Resources Control Board (SWRCB) has listed several water bodies as impaired due to sediment concentrations and toxicity exceeding regulatory criteria in the Mugu Lagoon and Port Hueneme area, which neighbor the Project area. Additionally, throughout the Southern California Bight, from Point Conception to Huntington Beach, natural discharges of liquid petroleum occur from fissures in the ocean floor. No specific impairments have been listed for the Ormond Beach area. The sediments in the vicinity of the offshore horizontal drill exit points were collected and analyzed for potential contamination, and no contamination was detected.

[1] An analyte is the substance in an analysis that is being identified or determined.

Table 4.18-2 Sediment Analytical Results – BHP Billiton LNG International Inc.

Analyte	Quadrant 1			Quadrant 2			Quadrant 3			Quadrant 4			Screening Levels	
	0’	10’	15’	0’	10’	15’	0’	10’	15’	0’	10’	15’	ERL	ERM
Metals (mg/kg)														
-- Aluminum (x 1000)	6.25	NA	8.92	7.11	8.00	9.29	6.22	9.11	10.30	7.24	NA	6.89	---	---
-- Antimony	0.09	0.28	0.14	0.15	0.11	0.14	0.14	0.12	0.1	0.09	0.04	0.07	---	---
-- Arsenic	3.24	3.41	1.84	3.46	2.37	3.9	3.9	2.63	2.04	2.67	1.65	1.61	8.2	70
-- Barium	170	116	126	97.3	110	104	104	111	107	109	81.3	84.2	---	---
-- Beryllium	0.2	0.35	0.27	0.24	0.25	0.28	0.2	0.27	0.27	0.21	0.21	0.19	---	---
-- Cadmium	0.15	0.45	0.24	0.3	0.23	0.27	0.27	0.27	0.23	0.2	0.23	0.19	1.2	9.6
-- Chromium	15.5	22	16.4	14.6	15.4	16.9	13.9	16.8	18.2	14	13.7	12.5	81	370
-- Cobalt	3	5.9	4.33	3.49	3.83	4.58	4.58	4.19	4.74	3.39	3.55	3.52	---	---
-- Copper	3	10.5	6.75	4.96	5.87	6.91	6.91	6.23	7.46	4.28	5.79	5.48	34	270
-- Iron (x 1000)	15.4	21.9	16.9	14.0	15.6	18.1	18.1	16.7	17.7	13.3	13.7	13.2	---	---
-- Lead	4.34	5.39	3.95	3.71	4.05	4.00	4.00	3.97	4.53	3.73	3.73	3.08	46.7	218
-- Manganese	196	257	231	179	203	229	229	211	230	180	170	169	---	---
-- Mercury	0.03	0.11	0.05	0.04	0.02	0.03	0.03	0.03	0.02	0.01	0.01	0.01	0.15	0.71
-- Molybdenum	0.74	1.39	0.79	1.32	0.74	1.07	1.07	0.78	0.63	0.72	0.57	0.66	---	---
-- Nickel	6.66	13	9.27	7.98	8.57	9.81	9.81	8.87	10.2	7.55	8.29	7.56	20.9	51.6
-- Selenium	0.51	0.68	0.51	0.53	0.5	0.54	0.54	0.56	0.48	0.48	0.39	0.4	---	---
-- Silver	0.06	0.17	0.09	0.07	0.03	0.06	0.06	0.06	0.05	0.02	ND	ND	1	3.7
-- Strontium	62.2	78.1	72.7	53.7	67.2	67	67	66.7	73.2	54.4	52.8	60.8	---	---
-- Thallium	0.09	0.19	0.13	0.11	0.11	0.14	0.14	0.13	0.16	0.1	0.11	0.1	---	---
-- Tin	0.99	1.25	1.09	0.86	0.94	1.03	1.03	0.99	1.02	0.84	0.7	0.7	---	---
-- Titanium	1100	1350	1350	912	1120	1230	1000	1260	1180	920	758	953	---	---
-- Vanadium	33.7	46.6	35.2	32.2	33.4	37	30.8	36.1	36.7	29.4	29.6	26.8	---	---
-- Zinc	22.7	39.9	29.2	24.3	26.5	30.7	30.7	28.5	32.5	24.6	25.1	23.6	150	410

Table 4.18-2 Sediment Analytical Results – BHP Billiton LNG International Inc.

Analyte	Quadrant 1			Quadrant 2			Quadrant 3			Quadrant 4			Screening Levels	
	0'	10'	15'	0'	10'	15'	0'	10'	15'	0'	10'	15'	ERL	ERM
Pesticides (ng/g)	No analytes were detected at or above the laboratory detection limit													
PCBs (ng/g)	No analytes were detected at or above the laboratory detection limit													
Phenols (ng/g)	No analytes were detected at or above the laboratory detection limit													
VOCs (ng/g)	No analytes, except those listed below, were detected at or above the laboratory detection limit													
-- bis(2-Ethylhexyl) phthalate	105	ND	ND	33.2	ND	ND	ND	ND	ND	18.7	ND	ND	---	---
-- Diethylphthalate	9	11.6	ND	9.5	6.6	5.6	12.4	ND	5.3	ND	ND	ND	---	---
-- DiMethylphthalate	5.5	ND	ND	ND	ND	ND	14.9	ND	ND	ND	ND	ND	---	---
-- Di-n-butylphthalate	21.9	12.9	9.4	16.1	14.2	11.8	ND	10.9	10.1	13.3	11.4	6	---	---
-- Di-n-octylphthalate	24.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	---	---
PAHs (ng/g)	No analytes, except those listed below, were detected at or above the laboratory detection limit													
-- 1-Methyl naphthalene	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	---	---
-- Naphthalene	ND	ND	ND	ND	ND	3.5	ND	ND	ND	ND	ND	ND	---	---

Source: Environmental Sampling and Test Results, Results of Chemical Testing of Vibrocore Samples Taken from Location of Seafloor Exit for Horizontal Directional Drilled (HDD) Borehole, March 2004.

Notes: mg/kg = milligrams per kilogram; ng/g = nanograms per gram; ND = not detected at or above the laboratory detection limit; --- = no established ERL or ERM; ERL = effects range - low (the value above which adverse effects on sensitive life stages and/or species are expected to begin); ERM = effects range – medium (the value above which adverse effects on most species are frequently observed).

Table 4.18-3 Sediment Analytical Results – Reliant Energy

Sample No.	Approximate Location	Metals (in milligrams per kilogram)			
		Chromium	Copper	Nickel	Zinc
B1	2,750 feet (840 m) NW of outfall	9.1	3.5	5.9	20
B2	1,000 feet (305 m) NW of outfall	7.6	2.8	4.9	16
B3	Along path of outfall	7.4	3.1	5.8	16
B4	1,000 feet (305 m) SE of outfall	10	11	6.3	21
B5	2,750 feet (840 m) SE of outfall	8.5	3.6	6.1	21
B6	Along path of outfall	8.0	3.7	6.7	19
ERL		81	34	21	150
ERM		370	270	51.6	410

Source: National Pollutant Discharge Elimination System 2004 Receiving Water Monitoring Report, Reliant Energy Ormond Beach Generating Station, Ventura, California, March 2005.

Notes: NW = northwest; SE = southeast; ERL = effects range - low (the value above which adverse effects on sensitive life stages and/or species are expected to begin); ERM = effects range - medium (the value above which adverse effects on most species are frequently observed).

Table 4.18-4 Water Quality Results – Reliant Energy

Parameter	Summer				Winter			
	Surface		Bottom		Surface		Bottom	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Temperature (°F [°C])	68.1 (20.1)	71.3 (21.8)	60.5 (15.9)	69.1 (20.6)	58.5 (14.7)	62.0 (16.7)	56.2 (13.4)	60.4 (15.8)
Dissolved Oxygen (mg/L)	7.72	8.47	7.73	8.41	7.42	8.42	7.04	8.47
pH (standard units)	7.72	8.47	7.95	8.09	7.96	8.22	7.97	8.22
Salinity (practical salinity units)	33.22	33.36	33.31	33.79	33.18	33.30	33.26	33.34

Source: National Pollutant Discharge Elimination System 2004 Receiving Water Monitoring Report, Reliant Energy Ormond Beach Generating Station, Ventura, California, March 2005

Notes: Min. = minimum; Max. = maximum; °F = degrees Fahrenheit; °C = degrees Celsius; mg/L = milligrams per liter.

A metal recycling facility previously owned by Halaco Engineering Co. is located at Ormond Beach. The facility includes a slag (waste) pile and waste ponds that may be contaminating nearby wetlands and groundwater. The U.S. Environmental Protection Agency (USEPA) is currently planning a removal action (see Section 4.13, "Land Use").

Onshore

4.18.1.3 Groundwater Resources

Shore Crossing and Center Road Pipeline Area

Groundwater elevations range from sea level in the west to approximately 150 feet (46 m) above sea level from the shore crossing along the Center Road Pipeline route.

The five aquifers in this area contain fresh water, except in areas of saltwater intrusion near the coast. No known groundwater wells used for public, domestic, or agricultural supply are in the immediate Project vicinity. Groundwater in the area is managed for agricultural and municipal services.

Installation of the shore crossing pipelines would be conducted using HDB. Using this methodology, the annulus of the borehole is sealed with a non-hazardous bentonite clay slurry as the drill head progresses, thereby preventing saltwater intrusion into any aquifers along the borehole path. The Applicant has prepared a drilling fluid release monitoring plan, which establishes monitoring to minimize the potential for environmental effects from HDB operations as well as cleanup and notification requirements in the event of a release (Brungardt Honomichl 2006; see Appendix D1). At the offshore exit point, the Applicant would construct a transition excavation (see Section 2.6.1, "Shore Crossing via HDB" for information concerning the transition excavation), which would contain any drilling fluids released when the drill head exits the seafloor, estimated at a maximum total of 10,000 gallons (38 m^3) for both pipelines and consisting of 95 to 98 percent water and 2 to 5 percent clay. HDB is described in Section 2.6.1, "Shore Crossing via HDB."

Line 225 Pipeline Loop Area

The Santa Clara River Valley East Basin is bordered on the north by the Piru Mountains, on the west by impervious rocks of the Modelo and Saugus Formations and a constriction in the alluvium on the south by the Santa Susana Mountains, and on the south and east by the San Gabriel Mountains. The surface is drained by the Santa Clara River, Bouquet Creek, and Castaic Creek. Groundwater in the subbasin is generally unconfined in the alluvium but may be confined, semi-confined, or unconfined in the Saugus Formation. Groundwater of the East Basin is managed mainly for servicing municipal demands within the Santa Clarita Valley.

4.18.1.4 Surface Water

Center Road Pipeline

Freshwater streams and waterways on the Oxnard Plain include the Santa Clara River, Calleguas Creek, Conejo Creek, the Oxnard Drain, the J Street Drain, and the Beardsley Wash-Revolon Slough Complex. Numerous other agricultural drainages throughout the Oxnard Plain are used to irrigate adjacent crops and to direct water and urban runoff to the Pacific Ocean. In most cases, these artificial waterways are highly disturbed by fluctuating water levels, vegetation maintenance, and dredging. The proposed alignment crosses several agricultural drainages and flood control channels (see Section 4.8, "Biological Resources—Terrestrial," for a list of the drainages and flood control channels).

Table 4.18-5 lists all surface water features that would be parallel to or crossed by the proposed pipeline route and alternatives, including agricultural drainages and flood control channels, except for the Santa Barbara Channel/Gonzales Road Alternative, which is discussed in 4.18.5.2. These are also identified on Figure 4.18-1.

Line 225 Pipeline Loop Project Area

The upper Santa Clara River flows westward through the very broad and low-gradient Santa Clarita Valley. Four major streams occur in the Line 225 Pipeline Loop Project area in the upper Santa Clara River watershed: the mainstem Santa Clara River, the South Fork Santa Clara River, Castaic Creek, and San Francisquito Creek. These streams, at the proposed crossings, are dry throughout most of the year until the onset of rain in the fall. The Santa Clara River includes a perennial reach downstream of the Line 225 Pipeline Loop because of wastewater discharged from the Valencia Water Reclamation Plant.

Surface water features are located parallel to, or would be crossed by, the proposed Project (see Table 4.18-6 and Figure 4.18-2). The Line 225 Pipeline Loop crosses the South Fork Santa Clara River at Milepost (MP) 3.7 between San Fernando Road and Magic Mountain Parkway. The Line 225 Pipeline Loop would cross the South Fork Santa Clara River (MP 3.7), the Santa Clara River (MP 5.2), and San Francisquito Creek (MP 5.6). The pipeline would cross the Santa Clara River and San Francisquito Creek at McBean Parkway by hanging it underneath the open girder bridges. The pipeline across the South Fork Santa Clara River at Magic Mountain Parkway would be installed inside a closed girder bridge. Other crossings such as at several concrete-lined flood control channels may require using existing road bridges or horizontal directional drilling (HDD). To avoid or reduce impacts to aquatic resources, dry watercourse or minor wet crossings would be open-cut-trenched during the dry season to reduce the potential for erosion.

Impaired Water Bodies

The SWRCB lists impaired water bodies in the State as part of Clean Water Act Regulation 303(d). Table 4.18-7 lists all the impairments (by total maximum daily load [TMDL]), based on water column, sediment, and tissue samples). A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The calculation must include a margin of safety to ensure that the water body can be used for the purposes the State has designated. The calculation must also account for seasonal variation in water quality. Water quality standards are set by states, territories, and tribes. They identify the uses for each water body and the scientific criteria to support that use. The Clean Water Act § 303 establishes the water quality standards and TMDL programs.

Table 4.18-5 Surface Water Bodies Along the Center Road Route and Alternatives

Location (Milepost [MP])[a]	Description of Water Body	Center Road				Point Mugu/ Casper Road	Arnold Road	Santa Barbara/
		Proposed Route	Alt 1	Alt 2	Alt 3			
0.25	Tributary to Pacific Ocean. Unnamed agricultural drainage.	X	X	X	X			
0-1	Agriculture/flood control crossing					X	X	
1-2	Agriculture/flood control crossing					X	X	
1.6–1.8 (Alt 1)	Oxnard Industrial Drain. Concrete flood control channel.		X					
1.8–2.8 (Alt 1)	Rice Road Drain. Concrete flood control channel.		X					
5.0 (Alt 2)	Mugu Drain. Vegetated agricultural drainage. Concreted only at Pleasant Valley Road crossing.			X				
6.3 (Alt 2)	Tributary to Revolon Slough. Vegetated agricultural drainage. Concreted only at Wolff Road crossing.			X				
6.7 (Alt 2)	Tributary to Revolon Slough. Concrete flood control channel.			X				
7.0 (Alt 2)	Revolon Slough. Concrete flood control channel.			X				
9.5	Nyeland Drain. Concrete flood control channel.	X			X			
12.7	Tributary to Nyeland Drain. Unnamed, vegetated agricultural drain.		X					
13.0	Ferro Ditch. Vegetated agricultural/flood control channel.		X					
13.7	La Vista Drain. Other Waters of the U.S (as defined by the U.S. Army Corps of Engineers). Concrete flood control channel.		X	X				X
10.4–10.6	Beardsley Wash. Concrete flood control channel.	X		X	X			
10.6–11.8	Santa Clara Diversion. Concrete flood control channel.	X		X	X			
11.8–12.5	Santa Clara Drain. Concrete flood control channel.	X		X	X			
12.5–13.7	Santa Clara Drain. Vegetated agricultural/flood control drainage.			X				
13.0–13.1 (Alt 1)	Los Angeles Drain. Concrete flood control channel.		X					
13.0–13.3	Unnamed agricultural drain	X						
14.2	Unnamed agricultural drain	X						
14.3	Unnamed agricultural drain	X						

[a]The location indicated is based on mileposts for the proposed route, unless otherwise noted.

‘X’’ indicates presence of the surface water feature along the route specified.

Sources: Entrix 2004b; Entrix 2005.

Table 4.18-6 Surface Water Bodies Along the Line 225 Pipeline Loop

Location (milepost)[a]	Description of Water Body	Proposed Route	Alternative Route
3.7	South Fork Santa Clara River Vegetated waters and unvegetated natural channel	X	X
5.2	Santa Clara River	X	
5.6	San Francisquito Creek Vegetated waters and unvegetated natural channel	X	
5.7 (Alt)	Santa Clara River		X
2.4	Tributary to South Fork Santa Clara River Unnamed concrete flood control channel	X	X
1.7	Unvegetated natural channel	X	X
1.8	Unvegetated natural channel	X	X
1.0	Unvegetated natural channel	X	X
0.7	Unvegetated natural channel	X	X

'X' indicates presence of the surface water feature along the route specified.

[a]The location indicated is based on mileposts for the proposed route, unless otherwise noted.

Sources: Entrix 2004b; Entrix 2005.

4.18.2 Regulatory Setting

Water quality and sediments are regulated pursuant to Federal, State, and local laws and regulations. These regulations prescribe such things as permits for specific activities and regional water quality objectives or standards. Major Federal, State, and local laws and regulations are identified in Table 4.18-8.

The Applicant, or its designated representative, would treat, discharge, and/or dispose of wastes and wastewaters in accordance with the appropriate Federal, State, and local laws and regulations identified above:

- Installation of an U.S. Coast Guard (USCG)-approved Type II Marine Sanitary Device for sanitary sewage;
- Obtaining and meeting the discharge requirements of NPDES permit(s);
- Preparation and implementation of SPCC Plans for onshore and nearshore activities;
- Preparation and implementation of oil spill contingency plans for oil transport-related facilities;
- Preparation of a Facility Response Plan for the FSRU;
- Conducting HDB, HDD, and trenching activities in accordance with its Section 404 Waterways Permit;
- Obtaining and implementing SWPPPs;
- Storage of hazardous materials/wastes in U.S. Department of Transportation (USDOT)-approved containers;

Insert (1 of 2)

Figure 4.18-1 Streams, Canals, and Agricultural Ditches in the Project Area, Ventura County

Insert (2 of 2)

Figure 4.18-1 Streams, Canals, and Agricultural Ditches in the Project Area, Ventura County

Insert (1 of 2)

Figure 4.18-2 Streams, Canals, and Agricultural Ditches in the Project Area, Los Angeles County

Insert (2 of 2)

Figure 4.18-2 Streams, Canals, and Agricultural Ditches in the Project Area, Los Angeles County

Table 4.18-7 Clean Water Act Section 303(d) List Impaired Water Bodies in the Vicinity of the Cabrillo Port Project (303d list approved July 2003)

Feature Name	Pollutant/Stressor	Potential Sources	TMDL Priority; *Proposed TMDL Completion*
Center Road Pipeline			
Ormond Beach (near Oxnard Industrial Drain and J Street Drain)	Bacteria Indicators, e.g., fecal coliforms and enterococci	Nonpoint and Point Sources	Low *No date*
Calleguas Creek Reach 4 (Revolon Slough)	Nitrogen, algae, chlorpyrifos, soluble and insoluble organic compounds (pesticides), toxicity, PCBs, trash	Nonpoint and Point Sources; Agriculture	Low, Medium, and High[a] *2002 and 2004*
Calleguas Creek Reach 5 (Beardsley Channel)	Nitrogen, algae, chlorpyrifos, soluble and insoluble organic compounds (pesticides), PCBs, trash	Nonpoint and Point Sources; Agriculture	Low, Medium, and High *2002, 2003, 2004*[a]
Port Hueneme Harbor	Elevated Tissue Levels (DDT, PCBs)	Nonpoint sources	Medium *No date*
McGrath Lake	Elevated sediment levels (Chlordane, DDT, Dieldrin, PCBs), Fecal Coliform, Sediment Toxicity	Nonpoint Sources; Agriculture; Landfills	Low, Medium[a] *No date*
McGrath Beach	High Coliform Count	Nonpoint source	High *2003*
Calleguas Creek Reach 1 (Mugu Lagoon)	Copper, Mercury, Nickel, Zinc, Bird Reproductivity (DDT), Elevated Tissue Levels (Chlordane, DDT, Endosulfan, Dacthal, Toxaphene, PCBs, Arsenic, Cadmium, Silver), Nitrogen, Elevated Sediment Levels (DDT, Toxaphene), Sediment Toxicity, Excessive Sediment	Nonpoint and Point Sources; Agriculture	Medium *2002*
Line 225 Pipeline Loop			
Santa Clara River Reach 8 - W Pier Hwy 99 to Bouquet Cyn. Rd	Chloride, high coliform count	Nonpoint and Point Sources	Medium, High[a] *2002*

Source: LARWQCB 2004.

Note:

[a]Varies depending on pollutant/stressor.

Table 4.18-8 Major Laws, Regulatory Requirements, and Plans for Water Quality and Sediments

Law/Regulation/Plan/ Agency	Key Elements and Thresholds; Applicable Permits
International	
International Convention for the Prevention of Pollution from Ships (MARPOL) *- U.S. Coast Guard (USCG)*	• Annex I requires vessels to be able to store oil residues on board until the residues can be discharged to reception facilities or into the sea, providing the ship is more than 50 NM (57.6 miles or 92.7 km) from the nearest land. The oil content of the effluent must be less than 15 parts per million (ppm). The ship must have an operational oil discharge monitoring and control system, oily water separating equipment, and oil filtering system or other installation. • Annex IV prohibits the discharge of sewage into the sea, except when the ship is discharging ground-up and disinfected sewage using a system approved by the Administration at a distance of more than 3 NM (3.5 miles or 5.6 km) from the nearest land or sewage that is not comminuted or disinfected at a distance of more than 12 NM (13.8 miles or 22.3 km) from the nearest land; or the ship operates an approved sewage treatment plant that has been certified by the Administration. The effluent may not produce visible floating solids in nor cause the discoloration of the surrounding water. • Annex V prohibits dumping floatable dunnage, lining, and packing material within 25 NM (28.8 miles or 46.3 km) of shore. Prohibits dumping other unground garbage within 12 NM (13.8 miles or 22.2 km).
International Convention on the Control of Harmful Anti-fouling Systems on Ships (MARPOL) *- USCG*	• Anticipated to be ratified before full implementation date of January 1, 2008. • Vessels may not bear compounds (anti-fouling/biocides, etc.) on their hulls or external parts of surfaces. • Vessels may bear a coating that forms a barrier to such compounds leaching from the underlying non-compliant anti-fouling systems.
Federal	
U.S. Clean Water Act (CWA) *- U.S. Environmental Protection Agency (USEPA);* *- U.S. Army Corps of Engineers (USACE);* *- Los Angeles Water Quality Control Board - (LARWQCB)*	• The objective is to restore and maintain the chemical, physical, and biological integrity of our waters. Specifically, - Prohibits discharges of untreated sewage with a fecal coliform bacterial count greater than 200 colonies per 100 milliliters (mL), or total suspended solids exceeding 150 milligrams per 100 milliliters (mg/mL) within 3 NM (3.5 miles or 5.6 km) of the shoreline. - Requires a certified operable marine sanitation device on every vessel (U.S. and foreign) with an installed toilet. • Requires the development of a facility-specific Spill Prevention, Control and Countermeasures (SPCC) Plan for the management of fuels and hazardous materials (see also National Oil and Hazardous Substances Pollution Contingency Plan, below). • Section 401 of the CWA requires states to review projects and Federal permits to ensure that the projects are in compliance with state water quality standards.
U.S. Clean Water Act, Section 402 U.S. Clean Water Act *- LARWQCB; USEPA*	• National Pollutant Discharge Elimination System (NPDES) permits apply to point-source discharges and are developed to ensure that these discharges comply with the standards established in the Ocean Plan and/or the Regional Water Quality Control Plan, i.e., Basin Plan. • Under the NPDES program, all point sources that discharge directly into

Table 4.18-8 Major Laws, Regulatory Requirements, and Plans for Water Quality and Sediments

Law/Regulation/Plan/ Agency	Key Elements and Thresholds; Applicable Permits
	waterways are required to obtain a permit regulating the discharge. Each NPDES permit specifies effluent limitations for particular pollutants and monitoring and reporting requirements for the proposed discharge. • Discharges to Federal waters that are not also waters of the State would require USEPA Region 9 approval and discharges to State waters would require LARWQCB approval. Administration of the NPDES permits, management of monitoring data submitted by permittees, compliance monitoring, and enforcement are the primary responsibility of the states. • The discharge of hydrostatic test water generated during onshore pipeline integrity testing would require a NPDES permit. • The discharge of hydrostatic test water generated during subsea pipeline integrity testing would require a separate NPDES permit, which would be obtained through USEPA Region 9 and/or the LARWQCB, depending on the discharge location. • The NPDES permit regulating storm water and point-source discharges from the FSRU would be obtained through USEPA Region 9 since it would be situated in Federal waters. The permit would regulate storm water runoff and gray water discharge from the FSRU and associated facilities. • The State of California has adopted a general storm water permit covering nonpoint source discharges from certain industrial facilities and from construction sites involving more than one acre. The Construction General Permit requires preparation of a storm water pollution prevention plan (SWPPP) and implementation of best management practices (BMPs) to reduce the potential for pollutants (chemicals and sediment) to be discharged from the construction site to waters of the State. • A SWPPP will be prepared and implemented to address the specific water quality concerns for the construction phase of the Project as required by the NPDES permit. • The discharge of groundwater potentially encountered during excavation and drilling would require an NPDES permit.
U.S. Clean Water Act, Section 404 *- USACE*	• The USACE is responsible for administering Section 404 Waterways Permits to regulate dredging and filling activities within U.S. waters. The permit would be developed to ensure that the proposed activity is conducted in a manner intended to protect aquatic resources, including water quality. A Section 404 Waterways Permit would be necessary for trenching across waters of the United States.
Spill Prevention, Control and Countermeasure (SPCC) Plans, required under the Oil Pollution Prevention Regulation; Non-Transportation-Related Onshore and Offshore Facilities – 40 CFR § 112 *- USEPA and USCG*	• Requires facilities that store, handle, or produce significant quantities of hazardous material to prepare an SPCC Plan to ensure that containment and countermeasures are in place to prevent release of hazardous materials to the environment. • The USCG and the USEPA share responsibility for Federal On-Scene Commander (FOSC) oversight for spills. • The Project would be required to have an SPCC Plan for the onshore construction phase and also if any shoreside transfer stations are manned during operations. • An SPCC Plan is not required for vessels.

Table 4.18-8 Major Laws, Regulatory Requirements, and Plans for Water Quality and Sediments

Law/Regulation/Plan/ Agency	Key Elements and Thresholds; Applicable Permits
Facility Response Plan Rules, required under the Oil Pollution Prevention Regulation; Non-Transportation-Related Onshore and Offshore Facilities (40 CFR § 112.20) - *USCG*	• Establishes requirements for Facility Response Plans to respond to a worst-case discharge and the resulting threats to human health and the environment. • Establishes procedures, methods, equipment, and other requirements to prevent the discharge of oil from non-transportation-related onshore and offshore facilities. • Requires that facilities have the capability to adequately respond to a spill. • A Facility Response Plan would be required for the FSRU because it would store 264,000 gallons (1,000 m^3) of fuel on board. • Basic requirements include: immediate spill notification to the National Response Center, timely deployment of spill response equipment, and oil spill monitoring and response.
Resource Conservation and Recovery Act (RCRA) - *USEPA*	• See Section 4.12, "Hazardous Materials."
National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300)	• Authorized under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. 9605, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), Pub. L. 99-499; and by section 311(d) of the Clean Water Act (CWA), 33 U.S.C. 1321(d), as amended by the Oil Pollution Act of 1990 (OPA), Pub. L. 101-380. • Applies to discharges of oil into or on the navigable waters of the United States, on the adjoining shorelines, the waters of the contiguous zone, into waters of the exclusive economic zone, or that may affect natural resources of the United States • Provides for efficient, coordinated, and effective response to discharges of oil and releases of hazardous substances, pollutants, and contaminants in accordance with the authorities of CERCLA and the CWA. • Provides for the national response organization that may be activated in response actions. It specifies responsibilities among the Federal, State, and local governments and describes resources that are available for response. • Establishes requirements for Federal, regional, and area contingency plans.
State	
California Porter-Cologne Act. The Porter-Cologne Act (California Water Code Section 13000) - *LARWQCB*	• Governs water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act gives the State Water Resources Control Board (SWRCB) and Regional Water Quality Control Board (RWQCB) broad powers to protect water quality by regulating waste dischargers to water and land and requiring clean up of hazardous wastes.

Table 4.18-8 Major Laws, Regulatory Requirements, and Plans for Water Quality and Sediments

Law/Regulation/Plan/ Agency	Key Elements and Thresholds; Applicable Permits
California Coastal Act Chapter 3, Article 4 Section 30231 - *California Coastal Commission (CCC)*	• The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.
Coastal Zone Management Act of 1972, as amended Section 307(c)(3)(A) - *CCC*	• Requires any applicant for a required Federal license or permit to conduct an activity, in or outside of the coastal zone, to provide to the licensing or permitting agency a certification that the proposed activity complies with the enforceable policies of the State's approved program and that such activity must be conducted in a manner consistent with the program. The applicant is required to furnish to the State or its designated agency a copy of the certification with all necessary information and data.
California Fish and Game Code §§ 1600–1603. - *California Department of Fish and Game (CDFG)*	• Regulates activities that would "substantially divert or obstruct the natural flow of, or substantially change the bed, channel, or bank of, or use material from the streambed of a natural watercourse" that supports wildlife resources. • A Streambed Alteration Agreement must be obtained for any project that would result in impact on a river, stream, or lake.
California Ocean Plan - *SWRCB*	• Protects beneficial uses of and controls discharges into ocean waters. • The Ocean Plan objectives would be incorporated into the conditions of the NPDES permit(s) and into the Section 401 Water Quality Certification.
Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California - *SWRCB*	• The SWRCB prepared and adopted the California Ocean Plan, which protects beneficial uses of ocean waters within the State jurisdiction, and controls discharges. It incorporates the State water quality standards that apply to all NPDES permits into the Section 401 Water Quality Certification. • The SWRCB adopted the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan) on September 18, 1975. The Thermal Plan is not applicable to open ocean waters; it applies only to coastal and interstate waters and enclosed bays and estuaries. • The Ocean Plan authorizes the SWRCB to designate areas of special biological significance and requires wastes to be discharged at a sufficient distance from these areas to protect the water quality. These designated areas include parts of Santa Catalina, Santa Barbara, Anacapa, and San Nicolas Islands, Begg Rock, and Latigo Point to Laguna Point (SWRCB 2001).

Table 4.18-8 Major Laws, Regulatory Requirements, and Plans for Water Quality and Sediments

Law/Regulation/Plan/ Agency	Key Elements and Thresholds; Applicable Permits
Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990 *- CDFG Office of Oil Spill Prevention and Response (OSPR)*	• Established the OSPR within the CDFG. • Seeks to protect the waters of the State from oil pollution and to plan for the effective and immediate response, removal, abatement, and cleanup in the event of an oil spill. • Requires immediate cleanup of spills following approved contingency plans and fully mitigating impacts to wildlife. • The OSPR has the authority to direct oil and product spill response, cleanup, and natural resource damage assessment activities • Requires oil spill contingency plans for oil transport-related facilities.
Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) *- Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA)*	• Requires businesses to notify Californians about significant amounts of chemicals that are released into the environment. • Develops health-protective exposure standards for different media (air, water, land) to recommend to regulatory agencies. • The OEHHA administers the Proposition 65 program and evaluates all currently available scientific information on substances considered for placement on the Proposition 65 list. • The OEHHA makes recommendations to the CDFG and the SWRCB with respect to sport and commercial fishing in areas where fish may be contaminated
California Harbors and Navigation Code § 7340 *- CDFG*	• Regulates oil discharges and imposes civil penalties and liability for cleanup costs when oil is intentionally or negligently discharged to the waters of the State of California.
Local	
Water Quality Control Plan: Los Angeles Region Basin Plan *- LARWQCB*	• Incorporates by reference all applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations. The Plan designates beneficial uses for surface water and groundwater. • Basin Plan objectives would be incorporated into NPDES permit conditions and into the Section 401 Water Quality Certification review.

- Maintenance of spill kits and absorbent materials in areas where hazardous materials are used and stored;
- Maintenance of current Material Safety Data Sheets (MSDSs) for all hazardous materials/wastes;
- Preparation and implementation of site-specific health and safety plans; and
- Disposal of hazardous materials/wastes at licensed landfills.

NPDES permits would be required for two aspects of this Project. Since the FSRU is a facility rather than a vessel, it would require a NPDES permit from USEPA Region 9 for all discharges that occur during operation because it is located in Federal waters. In addition, NPDES permits would be required from the LARWQCB for onshore construction-related activities that require discharges such as storm water, hydrostatic

test water, and groundwater from dewatering activities, and for operation activities such as the new metering station.

The National Response Plan (NRP), most recently revised and updated by the U.S. Department of Homeland Security in 2004, outlines procedures for interaction and coordination of response activities among Federal (USCG, USEPA, Federal Emergency Management Agency, U.S. Department of Defense, Occupational Safety and Health Administration, etc.), State, and local response agencies (police, firefighting, emergency management, first responder, etc.). The Oil and Hazardous Materials Incident Annex of the National Response Plan directs the Federal, State and local authorities to conduct training, plan and execute field exercises, share lessons learned, and, in general, develop and maintain specific procedures for responses to incidents of regional and national significance. A major incident at a deepwater port would be categorized as such an incident. The National Response Plan is supported by the National Contingency Plan, the National Incident Management System, and, at the regional level for an incident involving Cabrillo Port, by the Los Angeles/Long Beach Area Contingency Plan.

The Facility Response Plan would delineate and maintain safe operating conditions aboard the vessels. It would also specify the appropriate wind and sea conditions for operation of the vessels, refer to appropriate personnel and evaluation procedures, and require adherence to the ship's oil spill contingency plan. The USCG would retain final approval or denial authority for the plan.

4.18.3 Significance Criteria

For the purposes of this document, water quality impacts are considered significant if the Project:

- Violates Federal, State, or local agency water quality standards or objectives;
- Increases contaminant levels in the water column, sediment, or biota to levels shown to have potential to harm marine organisms, even if the levels do not exceed the formal water quality criteria;
- Changes background levels of chemical and physical constituents or causes elevated turbidity that would produce long-term changes in the receiving environment of the site, area, or region that would impair the beneficial uses of the receiving water;
- Causes resuspension of contaminated bottom sediments that would degrade the quality of water downstream in violation of Federal or State agency water quality standards or objectives;
- Alters the existing drainage pattern of the site, including alteration of channel bed armoring, bank composition, or stream hydraulic characteristics, in a manner that would result in:
    - An increase in short- or long-term erosion or siltation on- or offsite;

- An increase in the rate or amount of surface runoff that would exceed the capacity of existing or planned storm water drainage systems;
- Flooding on- or offsite; and
- A change of stream flow that would significantly damage either beneficial uses or aquatic life.

The following significance criterion is not applicable to the Project and is not analyzed further:

- The Project would not place permanent structures within a 100-year floodplain that would impede or redirect flood flows.

4.18.4 Impact Analysis and Mitigation

This impact analysis discusses Project impacts that occur offshore and onshore, both during construction/installation and during normal Project operations. Effects on marine biota are described in Section 4.7, "Biological Resources – Marine." Applicant-proposed measures (AM) and agency-recommended mitigation measures (MM) are defined in Section 4.1.5, "Applicant Measures and Mitigation Measures."

Impact WAT-1: Temporary Degradation of Offshore Water Quality due to Accidental Discharges

Accidental discharges of petroleum, sewage, or other contaminants from vessels during offshore construction and installation activities could temporarily degrade offshore water quality (Class III).

Vessels supporting installation of the FSRU and subsea pipelines would increase the potential for accidental discharges of petroleum hydrocarbons, contaminants, sewage, or gray water (from sinks and showers) exceeding water quality standards.

Small spills may occur from normal use of oils, lubricants, or solvents. During construction, these discharges would be anticipated to be small and infrequent. The degradation of water quality due to these small accidental discharges would be highly localized or limited to the immediate area of discharge, and the effects would be temporary because much of the discharged contaminant would dissipate or evaporate quickly. For example, if a release of oily bilge water were to occur, any contamination would be localized in the area of discharge. Because single discharge volumes would contain relatively small amounts of petroleum, this would have little or no long-term effect on ambient water quality.

Construction and supply vessels could accidentally discharge gray water or untreated sewage. However, any accidental discharge of untreated sewage would be unlikely or infrequent. While the discharge may contain harmful constituents, it would be in relatively small amounts and in the open ocean it would dissipate rapidly.

The prevention and response activities in the required Facility Response Plan and SPCC Plans would reduce this impact to below its significance criteria. No mitigation would be required.

Impact WAT-2: Short-Term Increase in Turbidity or Accidental Unearthing of Contaminants during Offshore Construction

The installation of the FSRU and subsea pipelines could disturb seafloor sediments or release drill cuttings or fluids, causing a short-term increase in turbidity or accidental unearthing of contaminants (Class III).

The offshore pipelines would be laid on the surface of the seafloor and therefore no excavation of contaminated sediments would occur. The pipelaying process could stir up contaminated surficial sediments; however, such disturbance would be of small quantities for a short duration, and these sediments would rapidly settle back to the seafloor. Also, the Applicant would conduct an unexploded ordnance survey along the path of the pipeline in the Pt. Mugu Sea Range.

During installation of the FSRU and pipeline, approximately 10 acres (4 hectares) of seafloor would be temporarily disturbed and thus temporarily increase turbidity in the water column. The disturbance of seafloor sediments during the installation of the FSRU, mooring system, and offshore pipelines could degrade water quality because of an increase in turbidity or resuspension of contaminated sediments. The temporary increase in turbidity could reduce light penetration, discolor the ocean surface, alter the ambient water chemistry such as pH and dissolved oxygen content, or interfere with filter-feeding benthic organisms sensitive to increased turbidity. The effects on water quality would be short-term and highly localized and therefore considered less than significant.

Some sediments may be contaminated with pollutants such as heavy metals. However, there are no known locations of contaminated sediments at the mooring turret, along the subsea pipeline route, or near Ormond Beach, and therefore there is no anticipated release of pollutants (see Section 4.12, “Hazardous Materials”).

During an anchor embedment period (24 hours per day), nine high-holding-power conventional drag-embedded anchors would be placed on the seabed and dug in for embedment; therefore, turbidity would increase near the seafloor for this period of time. The change to water quality in this area would be expected to be minimal, given the depth of water (2,850 feet or 869 m), and the effect would last only for the period of embedment. Therefore, the impact on water quality would be less than significant.

The subsea pipelines would be laid on the seafloor, except for the HDB beginning at a water depth of about 43 feet (13 m). Three telecommunication cables would be crossed: the Navy RELI cable, the Navy FOCUS cable, and the Global West cable. Both of the Navy cables are buried beneath the seabed while the Global West cable, which was never in operation, is laid on the seafloor. Concrete pillows would be installed for the pipeline to rest above the cable. As the pipeline is laid and where the

pillows are installed, sediments immediately under and adjacent to the pipeline and pillows would be dislodged and suspended in the water column. The increase in turbidity would depend on the size of the particles and the force by which the pipeline is laid. Nonetheless, the suspension of sediments would be localized and temporary. Turbidity levels would be anticipated to return to their normal range quickly; therefore, the effect on water quality would be not significant.

Preparation of the HDB exit hole locations would involve excavating an area for drill cuttings to accumulate. Turbidity would increase in the vicinity of the exit holes. The change in turbidity would be expected to last only for the period of the initial excavation, and when the drill cuttings are deposited as the HDB exits through the exit holes, and would be temporary, highly localized, and not significant. As stated previously, based on the results of recent sampling, the sediment in the area of the proposed HDB exit holes is not considered to be contaminated.

Literature shows that drilling fluid forms lightweight flocs (masses resembling wool formed by the aggregation of a number of fine suspended particles) when it mixes with seawater. Direct measurements of seafloor frac-outs (releases of drilling fluids) have demonstrated that, upon release, the warmer drilling fluid can extend upward into the cooler water column where buoyancy-induced turbulence disperses the drilling fluid, and currents transport the dilute mixture well away from the discharge point (Coats 2003). This tendency, however, is more likely to occur in deeper water associated with oil and gas drilling. For the proposed Project, the temperature differential between the drilling fluid moving through relatively shallow formations under the sea floor is likely to be similar to that of the seawater. Therefore, buoyancy of escaped drilling fluid would be less than occurs at typical deep water drilling sites.

While there is a concern that significant volumes of drilling fluid would be released when the HDB system exits the sea floor, the Applicant would use an HDB suction pump located near the cutting head with sufficient capacity to withdraw the majority of the anticipated drilling fluid volume as it flows toward the penetrated seafloor. Some drilling fluid would flocculate and disperse into an area near the exit point; however, divers would be stationed at the site during HDB operations to vacuum the released material until it clears. The vacuumed drilling fluid and seawater would be collected in holding tanks above water and disposed as required.

Following construction and installation of the offshore and shore crossing pipelines, these pipelines would be hydrostatically tested to ensure that there are no leaks. The test water would be treated with an oxygen scavenger and a corrosion inhibitor. A biocide would be added only if the test had to be conducted in excess of seven days. Hydrostatic testing of these pipelines is described in Section 2.6.2.5, “Post-Lay Testing.” Following the test, this water would be collected and disposed of in accordance with Federal, State, and local regulations and would not be discharged to the ocean.

This impact would not exceed its significant criteria, and no mitigation measures would be necessary.

Impact WAT-3: Short-Term Degradation of Surface Water or Groundwater Quality due to Accidental Release of Drilling Fluids

Accidental releases of drilling fluids at the shore during construction could degrade surface water or groundwater quality for the short term (Class II).

The Project would include shore crossing via HDB. Under normal operations, drilling fluids would remain in the HDB boreholes. Drilling fluids from drilling equipment include oils, hydraulic fluid, and drilling fluids (bentonite slurry). If cracks or fissures in the subsurface are encountered during drilling, drilling fluids can travel along them to the groundwater and enter adjacent surface water bodies. Releases of drilling fluids (inadvertent return of drilling fluids such as bentonite) could temporarily reduce water quality where released.

An evaluation of the effects of releases of drilling fluids on terrestrial resources is presented in Section 4.8, "Biological Resources – Terrestrial," and a discussion of the releases of drilling fluids in upland areas is presented in Section 4.12, "Hazardous Materials." By incorporating mitigation measures, this impact associated with HDB would be reduced to below its significance criteria.

Mitigation Measure for Impact Wat-3: Short-Term Degradation of Surface Water or Groundwater Quality due to Accidental Release of Drilling Fluids

MM WAT-3a. **Drilling Fluid Release Monitoring Plan.** The Applicant shall implement its Drilling Fluid Release Monitoring Plan to minimize the potential for releases of drilling fluids, to properly clean up drilling fluids in the event of a release, and notify appropriate agencies should a release occur. The Plan (see Appendix D1) would incorporate best management practices to reduce the impacts from releases of drilling fluids, including the following:

- Maintaining containment equipment for drilling fluids on site;
- Adding a non-toxic color dye to the drilling fluids to easily and quickly detect release of drilling fluids;
- Ensuring that a qualified environmental monitor or suitably trained water quality specialist is onsite full time near sensitive habitat areas during HDB activities;
- Stopping work immediately if there is any detection of bentonite seeps into surface water or sensitive habitats, for example, by a loss in pressure or visual observation of changes in turbidity or surface sheen;
- Reporting all bentonite seeps into waters of the State or sensitive habitat immediately to the Project's resource coordinator, the CSLC, the Los Angeles RWQCB, and the appropriate resource agencies: National Oceanic and

Atmospheric Administration Fisheries, U.S. Fish and Wildlife Service, the U.S Army Corps of Engineers, the California Department of Water Resources, the California Reclamation Board, the applicable city (Oxnard or Santa Clarita) and county (Ventura or Los Angeles); and

- Cleaning up and properly disposing of any release of drilling fluids to the satisfaction of regulatory agencies.

Implementation of the Drilling Fluid Release Monitoring Plan would minimize the potential for an accidental release of drilling fluids, and if such a release were to occur it would be quickly identified and reported to the appropriate regulatory agencies and as much of the spilled material as feasible would be removed. Therefore, this impact would be reduced to below its significance criteria.

Impact WAT-4: Short-Term Increase in Erosion due to Construction Activities

HDD and trenching at stream crossings, including release of hydrostatic test water, could cause short-term increases in erosion (Class II).

The movement of equipment and materials during construction could destabilize the soil surface and increase erosion potential from water and wind along the route and in the staging areas. Construction activities and loss of vegetation could cause accelerated erosion on steep slopes and in erosion-susceptible soils. Also, construction activities could cause erosion before vegetation is re-established. Any of these scenarios could lead to potential sedimentation of nearby creeks and drainages.

The most likely time for erosion to occur is after initial disturbance of the unpaved ground surface and before re-establishment of vegetative cover or placement of pavement, as appropriate. A soil's susceptibility to erosion varies and is a function of its characteristics such as texture and structure; topography (steepness of slope); surface roughness; amount of surface cover (vegetative or other); and climate. Erosion potential increases the longer soils are left bare. Erosion from water mainly occurs in loose soils on moderate to steep slopes, particularly during high-intensity storm events. Changes in drainage patterns as a result of the Project's construction could result in erosion of the soil following construction.

Erosion is not anticipated in the Center Road Pipeline area or in areas adjacent to the proposed alternatives because of the relatively flat to gently sloping topography; however, there are certain soils along the pipeline that have slight to moderate erosion potential because they have a slight slope (between 2 and 9 percent) (see Section 4.5, "Agriculture and Soils"). Erosion in this area could lead to increased turbidity in agricultural drainages. Erosion could occur along the parts of the Line 225 Pipeline Loop located in mountainous terrain, with slopes ranging from 2 to 50 percent. Erosion in this area could increase the turbidity in the Santa Clara River or one of its tributaries.

Construction of the proposed pipelines would include several stream crossings. HDD and trenching activities through dry stream channels and excavation of drilling pits could

lead to sedimentation of stream channels. The release of drilling fluids could occur during HDD activities as a result of "frac-outs," i.e., the fluids could escape through cracks and fissures in the surrounding media because of the high pressures used (see Sections 2.6.1, "Shore Crossing via HDB," and 2.7.2.1, "Watercourse Crossings," for more detail on HDB and HDD operations).

Following construction and installation of the Center Road and Line 225 Pipeline Loop pipelines, the pipelines would be hydrostatically tested to ensure that there are no leaks. Because these tests are expected to be relatively short, the test water would not be treated with any chemicals. Hydrostatic testing of these pipelines is described in Section 2.7.1.8, "Hydrostatic Testing." Following the test, this water would be disposed of in accordance with Federal, State, and local regulations. If this water were to be discharged to land, the Applicant, or its designated representative, would implement its best management practices (BMPs) to control erosion: specifically, BMP 1-01 through 1-08, "Sediment Controls," BMP 3-01, "Dewatering Operations," and BMP 4-01 through 4-08 "Erosion Control and Soil Stabilization" (Sempra 2002). Also, the water would be tested prior to discharge to ensure that it met the NPDES discharge requirements and, if necessary, would be treated if it contained contaminants above the permit effluent limitations.

AM TerrBio-1a. Erosion Control (see Section 4.8, "Biological Resources – Terrestrial").

Mitigation Measures for Impact WAT-4: Short-Term Increase in Erosion due to Construction Activities

MM WAT-4a. Strategic Location for Drilling Fluids and Cuttings Pit. The Applicant or its designated representative shall ensure a pit has been excavated at the exit hole to collect and contain the drilling fluids and cuttings. Engineering controls shall be installed to ensure that fluids remain contained in the pit, including:

- Locating the entry pit and exit pit sufficiently far from a stream bank and at a sufficient elevation to avoid inundation by the stream and to minimize excessive migration of groundwater into the entry pit or exit pit;
- Isolating the entry pit and exit pit with silt fencing to avoid sediment transport into the surface water body;
- Isolating the spoils storage from the excavation of the entry pit using silt fencing to avoid sediment transport;
- Undertaking and completing proper disposal of excess spoils; backfilling and restoring the original contour of the entry pit and exit pit; and revegetating the area upon completion of the bore;
- Monitoring the drilling fluid, if a release of drilling fluids occurs, by a qualified environmental monitor or suitably trained water

quality specialist to determine the appropriate cleanup response; and

- Consulting with regulatory agencies to determine the next appropriate step to clean up the area.

MM WAT-4b. Energy Dissipater for Hydrostatic Test Water Discharge. For the hydrostatic test water discharge the Applicant or its designated representative shall design and install a suitable energy dissipater at the outlets and design and install suitable channel protection structures to ensure that there would be no erosion or scouring of natural channels within the affected watershed. Sandbags, rocks, or other materials or objects installed shall be removed from the site upon completion of hydrostatic testing.

MM WAT-4c. Transport Excess Trench Spoils Offsite. Excess trench spoils that are not used to backfill trenches shall be transported and disposed of offsite at an approved facility.

MM WAT-4d. Monitor Stream Crossing Construction. A qualified environmental monitor or suitably trained water quality specialist shall be present at each stream crossing construction site to ensure compliance with applicable permits and mitigation.

MM GEO-1b. **Backfilling, Compacting and Grading** would apply here (see Section 4.11, "Geologic Resources and Hazards").

With the application of these mitigation measures, designed to alleviate soil erosion during and after construction, the potential erosion impacts associated with the Project would be reduced to below the significance criteria.

Impact WAT-5a: Degradation of Water Quality due to Accidental Release of Untreated Gray Water, Deck Drainage, and other Discharges that do not Meet Water Quality Standards

The FSRU could accidentally release small amounts of contaminants, including petroleum, diesel fuel, detergents, or human waste, to marine waters in excess of water quality standards (Class III).

The FSRU would require the use of seawater and fresh water for the following activities:

Potable Water

Potable water would be generated using two seawater desalination units at a rate of approximately 264 gallons (1 m^3) per hour of fresh water from a seawater throughput of 740 gallons (2.8 m^3) per hour (assuming 70 percent efficiency). Brine generated during the desalination process would be discharged to the ocean at a rate of approximately 5,429 gallons (20.5 m^3) per day or 2 million gallons (7,500 m^3) per year.

Submerged Combustion Vaporizers

The submerged combustion vaporizer process generates excess water. These units would generate approximately 200,000 gallons (757 m^3) per day of clean, slightly acidic, distilled water. Of this total, approximately 10,000 gallons (37.9 m^3) per day would be treated for use onboard to supplement the potable water supply and for wash down water, estimated at 63,400 gallons (240 m^3) per week based on one 8-hour deck wash down event per week. The remaining 190,000 gallons (719.1 m^3) per day would be used for ballasting operations. Therefore, none of this water would be directly discharged to the ocean.

Gray Water

The volume of gray water (from showers and sinks) generated onboard would be approximately 2,250 gallons (8.5 m^3) per day or 821,250 gallons (3,100 m^3) per year, assuming an average crew of 30 and that the average crew member would generate 75 gallons (0.3 m^3) of gray water per day. This wastewater would be treated onboard the FSRU and discharged to the ocean.

Sanitary Wastes

Sewage (also known as black water) generated onboard is estimated at approximately 90 gallons (0.3 m^3) per day or 32,850 gallons (124 m^3) annually. Black water would be treated onboard using a USCG-certified Type II Marine Sanitation Device, which uses secondary treatment technology. The liquid effluent from the treatment system would be discharged to the ocean in accordance with the facility's NPDES permit and the sludge would be containerized and transported to shore for proper disposal at a local wastewater treatment facility once every three months in accordance with Federal, State, and local regulations. Because of the small volume of effluent from an approved secondary treatment device and the distance of the FSRU from shore, this discharge is unlikely to affect coastal waters or the shoreline.

Deck Drainage

When it rains, an estimated 10 gallons (0.04 m^3) per minute would flow onto the deck. For safety reasons, all rainwater and deck wash down water would be allowed to flow off the FSRU unimpeded, except in secondary containment areas where the water could become contaminated with oil. Water within the secondary containment areas would be processed through an oil/water separator before discharge to the ocean. The separator would be designed to handle the maximum anticipated flows and would be designed to meet the performance standards of the USEPA and the facility's NPDES permit. Oil collected in the oil/water separator would be containerized and transported to shore for proper disposal in accordance with Federal, State, and local regulations.

Cooling Water

The five onboard electrical generators would use approximately 264,200 gallons (1,000 m^3) per hour of uncontaminated non-contact seawater.

Bilge Water

Bilge water, i.e., the water that collects in the bottom of a ship as a result of leaks through propeller shafts, etc., is not anticipated to collect in the FSRU because it would not have a propulsion system. Some water may collect, however, from condensation and leaks in the cooling water system. Although this water would be anticipated to be clean, it would be processed through the oil/water separator prior to discharge to the ocean.

Fire Suppression Water

The main firefighting system would be tested annually using approximately 105,680 gallons (400 m^3) of seawater, then flushed with an equal volume of fresh water generated by the submerged combustion vaporizers. Each of the four firefighting pumps would be tested monthly (one pump each week) for approximately 15 minutes and would require 5,725 gallons (21.7 m^3) per minute, or 85,875 gallons (325 m^3) per test. Consequently, the volume of seawater required for testing the firefighting pumps would be approximately 4.12 million gallons (15,600 m^3) per year. In addition, each of the 25 deluge valves onboard the FSRU would be tested monthly using a total of approximately 47,700 gallons (180 m^3) per month of fresh water, generated by the submerged combustion vaporizers.

Ballast Water

Ballast water would be discharged in accordance with MARPOL and USCG regulations and protocols. During FSRU ballast operations, ocean water would be pumped into ballast tanks and shifted from one tank to another to keep the vessel evenly balanced or discharged back to the ocean, as required. Ballast water would not be chemically treated, and pumps would be screened to minimize entrainment of aquatic organisms. Any discharge of ballast water would contain little or no petroleum or other contaminants, and the discharge, if any, to receiving waters would be highly localized and temporary. Impacts occurring as a result of these regulated discharges would be less than the significance criteria. Liquefied natural gas (LNG) carriers would come to the FSRU carrying some ballast water, which would be exchanged outside the 200-NM (230 mile or 371 km) statutory limit according to regulations. While offloading their LNG cargo, the carriers would do just the opposite of the FSRU and pump ballast water into their tanks to compensate for the weight of LNG discharged to the FSRU.

The FSRU would maintain small quantities of other hazardous materials such as paints, solvents, lubrication oils, and the odorant. These would be stored in accordance with the FSRU's Facility Response Plan. Any spills would be cleaned up immediately. In the unlikely event that any of these materials entered the marine environment, the quantity would be extremely small, and the FSRU would be too far offshore to impact coastal water or the shoreline.

The LNG carriers and attending vessels would be powered by natural gas, thereby reducing the risk of a spill of large quantities of diesel fuel and minimizing impacts on

the marine environment from atmospheric deposition of pollutants from emissions from these vessels. All discharges from construction vessels, the FSRU, and tug/supply vessels would comply with the facility's NPDES permit. Each of the FSRU's water uses and discharges is described in more detail in Sections 2.2.2.3, "LNG Receiving, Storage, and Regasification Facilities," 2.2.2.4, "Utilities Systems and Waste Management," 2.2.2.5, "Safety Systems," and 2.2.2.6, "Other Operations." Impacts to the ocean environment from these discharges are discussed in Section 4.7, "Biological Resources – Marine."

The hulls of marine vessels are typically coated with a paint containing a biocide to prevent the growth of algae and the adherence of marine organisms such as barnacles. The International Convention of the Control of Harmful Anti-fouling Systems on Ships has been promulgated but has not yet been ratified (although it is expected to be ratified). At that time, Annex I of the Convention will include the following restrictions and requirements for vessels, including FSRUs, in excess of 400 gross tons:

- Vessels shall not bear anti-fouling/biocide compounds on their hulls or external parts or surfaces; or
- Shall bear a coating that forms a barrier to such compounds leaching from the underlying non-compliant anti-fouling system.

In summary, during normal operations on the FSRU, the discharges identified above would be regulated by an NPDES permit and would be in the acceptable range of the permit requirements. Although unlikely, the FSRU could accidentally release gray water or contaminated deck drainage before it is treated adequately to meet water quality standards and the conditions of the NPDES permit. In addition, accidental spills of materials used on the FSRU could occur. However, pursuant to the Facility Oil Pollution Contingency Plan, any release would be reported to the regulatory agencies and immediately cleaned up.

Potential impacts on the marine environment from the discharges described above are discussed in Section 4.7, "Biological Resources – Marine."

Compliance with required prevention and response measures, such as a Facility Response Plan for the FSRU, the SWPPP, and the NPDES permit, would ensure that the potential for degradation of water quality would be reduced and that the impacts of potentially hazardous materials and oil spills would be similarly reduced. This impact is considered potentially adverse but would be below the level of its significance criteria; therefore, no mitigation would be required.

Impact WAT-5b: Degradation of Water Quality due to an Accidental Release of Diesel Fuel from the FSRU, Pipelaying Vessel, or Service Vessels.

An accidental release of diesel fuel to marine waters would violate Federal and State water quality standards or objectives (Class I).

Diesel Spills

FSRU

The FSRU would store up to 264,000 gallons (1,000 m^3) of diesel fuel (that would be loaded prior to its departure from the shipyard to its proposed location) for the electrical generators and a natural gas odorant, both of which would be stored in USDOT-approved containers within secondary containment. The Applicant has prepared a Vessel Oil Pollution Contingency Plan to establish procedures for handling a range of possible oil pollution emergencies during pipelaying operations and a Facility Oil Pollution Contingency Plan for oil, natural gas, and other hazardous material releases during operation of the FSRU (BHPB 2004a and 2004b). These documents discuss prevention measures, offsite consequence analysis, resources at risk, on-water containment and recovery, on-water response equipment and services, spill response personnel, on-water response and recovery strategies, shoreline protection and cleanup, response organization, notification procedures, oiled wildlife care requirements, and oil spill response training and drills.

The Facility Oil Pollution Contingency Plan for the FSRU identifies a worst case scenario in which the entire contents of the diesel fuel storage tank (264,000 gallons or 1,000 m^3) is accidentally released into the ocean over a one-hour period under adverse weather conditions with no cleanup response. Under this scenario, the trajectory analyses show that oil could reach the coastline on the mainland from Carpenteria south to Point Fermin near San Pedro after approximately 72 hours, and under Santa Ana wind conditions, the shorelines of Anacapa, Santa Cruz, and Santa Rosa Islands. The spill analysis concludes that when oil spill response with available oil skimming capacity is considered, there are no cases that could deliver oil to any shoreline (BHPB 2004a).

If there were an accidental release of diesel fuel, it would be more likely to occur during the replenishment of the FSRU's diesel supply when supply vessels transfer approximately 350-gallon (1.3 m^3) capacity containers to the FSRU. If a container's integrity were damaged during the transfer and a portion or all of its total volume were released, the volume of such release would be relatively small, and its release would activate the Facility Oil Pollution Contingency Plan.

The Vessel Oil Pollution Contingency Plan for the pipelaying vessel identifies a worst case scenario in which a vessel carrying 1,500 m^3 (396,258 gallons) of fuel loses 25 percent (375 m^3 or 99,065 gallons) of its fuel. The trajectory analyses for the 72-hour spill scenario estimates four cases with variable currents and wind directions, in which there is no oil spill response (containment or skimming). The trajectory analyses show potential for oiling coastline on the mainland from approximately Isla Vista and Santa Barbara south to Point Fermin near Los Angeles Harbor. A case with a westerly current presents potential for oiling the shorelines of Anacapa and Santa Cruz Islands. A case with reinforcing wind and currents to the west also presents the potential for oiling the shorelines of Santa Rosa and San Miguel Islands. Due to the lack of southerly flowing offshore currents, the spill analysis shows no trajectories that could transport oil to

Santa Catalina or Santa Barbara Islands. When oil spill response with available oil skimming capacity is considered, the extent of shoreline that could be oiled is significantly reduced (BHPB 2004b).

The pipelaying vessel, because of its stationary exposure during pipeline installation, would be unable to avoid a collision with another vessel, which could result in a breach of its fuel tank and a release of diesel fuel to the marine environment. The risk of collisions has been addressed through procedures described in Impact MT-1 in Section 4.3, "Marine Traffic," and concludes that the mitigation measures identified would decrease marine traffic congestion, thereby reducing the risk of vessel collision, to a level below its significance criteria. Nonetheless, any release of diesel fuel would activate the Vessel Oil Pollution Contingency Plan.

Even with the implementation of the Facility Oil Pollution Contingency Plan for the FSRU or the Vessel Oil Pollution Contingency Plan for the pipelaying vessel, impacts to water quality from an accidental release of diesel fuel would remain significant.

Impact WAT-6: Temporary Degradation of Surface Water Quality During Maintenance Activities

Releases of petroleum or other contaminants during maintenance activities could temporarily degrade surface water quality (Class III).

The California Public Utilities Commission and the USDOT require periodic manual inspections and leak surveys of natural gas pipelines annually and internal inspection, i.e., pigging, every seven to ten years. Manual inspections and leak surveys would not cause a release of petroleum or other contaminants. Where internal inspection or maintenance/repair activities have the potential to impact regulated resources, such as air, surface water, listed species, or habitats, the Applicant or its designated representative would acquire individual project permits as required prior to commencing work. Repair and maintenance work would be conducted using the same AMs and BMPs as were used during construction, including BMP 2-01 through 2-09, "Waste Management and Material Controls," and BMP 3-01 through 3-09, "Non-Storm Water Discharge Controls" (Sempra 2002). The Applicant or its designated representative has incorporated the following into the Project:

AM WAT-6a. **Best Management Practices at Creek Crossings.** Best management practices would be employed at all creek crossings for major maintenance activities that could result in spills that could enter surface water pathways.

AM WAT-6b. **Spill Response Plan.** The Applicant or its designated representative would prepare a spill response plan to protect surface water at and near the surface water crossings. This plan would be incorporated into the SWPPP as a requirement of the construction storm water NPDES permit and the SPCC Plan. The

plan would identify specific measures to prevent, contain, and clean up any spills that could enter surface water pathways.

Using BMPs and implementing the spill response plan would minimize the potential for an accidental release of petroleum or other contaminants, and if such a release did occur it would be reported to the appropriate regulatory agencies and as much of the spilled material as feasible would be removed. With implementation of AM WAT-6a and AM WAT-6b, this impact would be below its significance criteria and no mitigation is necessary.

Impact WAT-7: Degradation of Surface Water Quality due to Erosion Caused by Regular Maintenance Activities

Regular maintenance of the pipelines could cause erosion and sedimentation of creeks from the use of maintenance vehicles or equipment, leading to short-term violations of water quality standards (Class III).

The Applicant or its designated representative has incorporated the following into the Project:

AM WAT-6a. Best Management Practices at Creek Crossings.

Maintenance of the ROW may include trimming vegetation and visual inspection by vehicle. These activities would be routine but infrequent. The minor increase in vehicle and foot traffic would be negligible and accelerated erosion or sedimentation is not anticipated.

Implementation of BMPs would significantly reduce any effects resulting from maintenance activities by reducing or eliminating erosion or sedimentation.

Table 4.18-9 summarizes the impacts and mitigation measures on water quality and sediments.

Table 4.18-9 Summary of Water Quality and Sediments Mitigation Measures

Impact	Mitigation Measure(s)
WAT-1: Accidental discharges of petroleum, contaminants, gray water, or sewage from vessels during offshore construction and installation activities could temporarily degrade offshore water quality (Class III).	None.
WAT-2: The installation of the FSRU and subsea pipelines could disturb seafloor sediments or release drill cuttings or fluids, causing a short-term increase in turbidity or accidental unearthing of contaminants (Class III).	None.
WAT-3: Accidental releases of drilling fluids at the shore crossing during construction could degrade surface water or groundwater quality for the short term (Class II).	**MM WAT-3a. Drilling Fluid Release Monitoring Plan.** The Applicant shall implement its Drilling Fluid Release Monitoring Plan to minimize the potential for releases of drilling fluids, to properly

Table 4.18-9 Summary of Water Quality and Sediments Mitigation Measures

Impact	Mitigation Measure(s)
	clean up drilling fluids in the event of a release, and notify appropriate agencies should a release occur. The Plan (see Appendix D1) would incorporate best management practices to reduce the impacts from releases of drilling fluids, including the following: • Maintaining containment equipment for drilling fluids on site; • Adding a non-toxic color dye to the drilling fluids to easily and quickly detect release of drilling fluids; • Ensuring that a qualified environmental monitor or suitably trained water quality specialist is onsite full time near sensitive habitat areas during HDB activities; • Stopping work immediately if there is any detection of bentonite seeps into surface water or sensitive habitats, for example, by a loss in pressure or visual observation of changes in turbidity or surface sheen; • Reporting all bentonite seeps into waters of the State or sensitive habitat immediately to the Project's resource coordinator, the CSLC, the Los Angeles RWQCB, and the appropriate resource agencies: National Oceanic and Atmospheric Administration Fisheries, U.S. Fish and Wildlife Service, the U.S Army Corps of Engineers, the California Department of Water Resources, the California Reclamation Board, the applicable city (Oxnard or Santa Clarita) and county (Ventura or Los Angeles); and • Cleaning up and properly disposing of any release of drilling fluids to the satisfaction of regulatory agencies.
WAT-4: HDD and trenching at stream crossings, including release of hydrostatic test water, could cause short-term increases in erosion (Class II).	**AM TerrBio-1a. Erosion Control.** **MM WAT-4a. Strategic Location for Drilling Fluids and Cuttings Pit.** The Applicant or its designated representative shall ensure that a pit has been excavated at the exit hole to collect and contain the drilling fluids and cuttings. **MM WAT-4b. Energy Dissipater for Hydrostatic Test Water Discharge**. For the hydrostatic test water discharge, the Applicant or its designated representative shall design and install a suitable energy dissipater at the outlets and design and install suitable channel protection structures to ensure that there would be no erosion or scouring of natural channels within the affected watershed.

Table 4.18-9 Summary of Water Quality and Sediments Mitigation Measures

Impact	Mitigation Measure(s)
	MM WAT-4c. Transport Sediment Spoils Off-Site. Sediment spoils that are not utilized to backfill trenches in stream channels shall be transported and disposed of offsite at an approved facility. **MM WAT-4d. Monitor Stream Crossing Construction.** A qualified environmental monitor or suitably trained water quality specialist shall be present at each stream crossing construction site to ensure compliance with applicable permits and mitigation. **MM GEO-1b. Backfilling, Compaction, and Grading** (see Section 4.11, "Geologic Resources and Hazards").
WAT-5a. The FSRU could accidentally release small amounts of contaminants, including petroleum, diesel fuel, detergents, or human waste, to marine waters in excess of water quality standards (Class III).	None.
WAT-5b. An accidental release of diesel fuel to marine waters would violate Federal and State water quality standards or objectives (Class I).	None.
WAT-6: Releases of petroleum or other contaminants during onshore pipeline maintenance activities could temporarily degrade surface water quality (Class III).	**AM WAT-6a. Best Management Practices at Creek Crossings.** Best management practices would be employed at all creek crossings for major maintenance activities that could result in spills that could enter surface water pathways. **AM WAT-6b. Spill Response Plan.** The Applicant or its designated representative would prepare a spill response plan to protect surface water at and near the surface water crossings. This plan would be incorporated into the SWPPP as a requirement of the construction storm water NPDES permit and the SPCC Plan. The plan would identify specific measures to prevent, contain, and clean up any spills that could enter surface water pathways.
WAT-7: Regular maintenance of the pipelines could cause erosion and sedimentation of creeks from the use of maintenance vehicles or equipment, leading to short-term violations of water quality standards (Class III).	**AM WAT-6a. Best Management Practices at Creek Crossings.**

4.18.5 Alternatives

4.18.5.1 No Action Alternative

As explained in greater detail in Section 3.4.1, "No Action Alternative," under the No Action Alternative, MARAD would deny the license for the Cabrillo Port Project and/or the CSLC would deny the application for the proposed lease of State tide and

submerged lands for a pipeline right-of-way. The No Action Alternative means that the Project would not go forward and the FSRU, associated subsea pipelines, and onshore pipelines and related facilities would not be installed. Accordingly, none of the potential environmental impacts identified for the construction and operation of the proposed Project would occur.

Since the proposed Project is privately funded, it is unknown whether the Applicant would fund another energy project in California; however, should the No Action Alternative be selected, the energy needs identified in Section 1.2, "Project Purpose, Need and Objectives," would likely be addressed through other means, such as through other LNG or natural gas-related pipeline projects. Such proposed projects may result in potential environmental impacts of the nature and magnitude of the proposed Project as well as impacts particular to their respective configurations and operations; however, such impacts cannot be predicted with any certainty at this time.

4.18.5.2 Alternative Deepwater Port Location – Santa Barbara Channel/Mandalay Shore Crossing/Gonzales Road Pipeline

The offshore part of this alternative would include components identical to those of the proposed Project; therefore, impacts during construction and operation would be similar to those of the proposed Project. The impacts for this Alternative would be the same as those for the proposed Project, and the same mitigation would apply.

4.18.5.3 Alternative Onshore Pipeline Routes

Center Road Pipeline Alternative 1

Table 4.18-5 above identifies surface water that would be parallel to or crossed by the Center Road Pipeline route and the Alternatives. Impacts along Center Road Pipeline Alternative 1 would be similar to those of the proposed Project route, and impacts for this Alternative would be the same as those for the proposed Project, and the same mitigation would apply.

Center Road Pipeline Alternative 2

Impacts along Center Road Pipeline Alternative 2 would be similar to those of the proposed Project route, and impacts for this Alternative would be the same as those for the proposed Project, and the same mitigation would apply.

Center Road Pipeline Alternative 3

Impacts along Center Road Pipeline Alternative 3 would be similar to those of the proposed Project route, and impacts and mitigation for this Alternative would be the same as those for the proposed Project.

Line 225 Pipeline Loop Alternative

The Line 225 Pipeline Loop Alternative would have impacts similar to those of the proposed Line 225 Pipeline Loop route, and impacts for this Alternative would be the same as those for the proposed Project. As identified in Table 4.18-6 above this alternative would cross the South Fork Santa Clara River at MP 3.7 and the Santa Clara River at MP 5.7.

The Applicant's or designated representative's options to install the pipeline across the river include the use of an existing bridge or HDD (see Section 2.6.1, "Shore Crossing via HDB," for discussion of HDB vs. HDD technology). If feasible, the pipeline bridge would result in the fewest impacts on water quality. Impacts from HDD would be similar to those of the proposed Project and are addressed under Impact WAT-4.

4.18.5.4 Alternative Shore Crossing/Pipeline Route

Point Mugu Shore Crossing/Casper Road Pipeline

Impacts for the Point Mugu Shore Crossing/Casper Road Pipeline Alternative would be similar to those of the proposed Project, and the same Applicant measures and mitigation measures would apply. Table 4.18-5 above identifies surface water bodies along the Center Road Pipeline route and alternatives. Minor water bodies and agricultural drainages along the pipeline route would be crossed using trenching or spanning techniques, as described for the proposed Project. The onshore HDB would cross beneath a canal parallel to the shoreline and within the Naval Base Ventura County (NBVC). HDB would be employed to install the pipeline across the beach, which would reduce or eliminate impacts from cutting, clearing, and/or removal of vegetation.

Impacts would be similar to those of the Arnold Road shore crossing because the shore crossing would cross essentially the same area. However, the proposed metering station would be located in an agricultural field at the southern end of Casper Road. In addition, the total length of the HDB would be longer than the Arnold Road shore crossing, which would create additional potential for an impact on freshwater/brackish wetlands, beaches and dunes, and non-tidal salt marshes if a release of drilling fluids were to occur.

Arnold Road Shore Crossing/Arnold Road Pipeline

Impacts for the Arnold Road Shore Crossing/Arnold Road Pipeline Alternative would be similar to those for the proposed Project, and the same Applicant measures and mitigation measures would apply. Minor water bodies and agricultural drainages along the pipeline route would be crossed using trenching or spanning techniques, as described for the proposed Project. A canal parallel to the shoreline and within the NBVC would be crossed by trenching. HDB would be employed to install the pipeline across the beach, which would reduce or eliminate impacts from cutting, clearing, and/or removal of vegetation.

4.18.6 References

BHP Billiton. 2004a. Facility Oil Pollution Contingency Plan, Cabrillo Port LNG Terminal. December 14.

_____. 2004b. Vessel Oil Pollution Contingency Plan, Cabrillo Port LNG Terminal Pipeline. December 14.

BHPB NPDES Permit Application. 2004. Submitted to USEPA by Steve Meheen. January.

Brungardt Honomichl & Co. P.A. 2006. Drilling fluid Release Monitoring Plan, Horizontal Direction Boring. BHPB Document No. WCLNG-BHP-DEO-TX-00-001-0. February 20.

Coats. 2003. Monitoring of Drilling Fluid Discharges to the Marine Environment of Estero Bay California during Construction of Directional Bores for the MCI/WorldCom Fiber Optic Cable Installation Project. Final Report of Offshore Monitoring Results. MRS Technical Report MRS-252.

Entrix, Inc. 2003. Environmental Analysis, Cabrillo Port Deepwater Port in the Vicinity of Ventura, California. August.

_____. 2004a. Environmental Analysis, Onshore Component of BHP Billiton LNG International Inc. Cabrillo Port Project. May.

_____. 2004b. BHP Billiton LNG International Inc., Cabrillo Port Project Draft Wetland Delineation. August.

_____. 2005. BHP Billiton LNG International Inc., Cabrillo Port Project Supplemental Wetland Delineation. June.

Hann, K. (BHP Billiton LNG International Inc. [BHPB]). 2005. Personal communication. September 23.

LA Times.com. 2004. "Oxnard Plant, Called a Top Area Polluter, Plans to Shut Down," by Fred Alvarez, Times Staff Writer. September 11.

Los Angeles Regional Water Quality Control Board. Basin Plan/Beneficial Uses. Accessed June 30, 2004.
http://www.swrcb.ca.gov/rwqcb4/html/meetings/tmdl/Basin_plan/basin_plan.html

Regional Water Quality Control Board (RWQCB) – Central Coast Region. 1994. Water Quality Control Plan (Basin Plan) Central Coast Region.
http://www.swrcb.ca.gov/rwqcb3/BasinPlan/Index.

Schiff, Kenneth C. and Richard W. Gossett. 1998. Southern California Bight 1994 Pilot Project: III, Sediment Chemistry, Southern California Coastal Water Research Project. January.

Sempra Energy Utilities. 2002. Water Quality Construction Best Management Practices Manual. December.

State Water Resources Control Board. 2002. Resolution No. 2003-0009. Approval of the 2002 Federal Clean Water Act Section 303(d) List of Water Quality Limited.

Welday, E.E. and J.W. Williams. 1975. Offshore surficial geologic map of California, map sheet 26, California Division of Mines and Geology.